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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/813,719

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10/09/2009

EXAMINER

GAKH, YELENA G

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/813,719	Applicant(s) BELL ET AL.	
	Examiner Yelena G. Gakh, Ph.D.	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,8-14,17,18,32,37,46 and 47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,8-14,17,18,32,37,46 and 47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Amendment, filed on 07/31/09, is acknowledged. Claims 1, 8-14, 17-18, 32, 37 and 46-47 are pending in the application and considered on merits.

Response to Amendment

2. The amendment filed 12/17/08 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: "identifying the shift in the NMR response that distinguishes the drilling fluid from formation fluid". While the terms used by the Applicants are not conventional terms of the art, the examiner interprets this as changing chemical shift of the NMR signal upon adding of the paramagnetic species, which is not disclosed in the specification. The specification discloses only changes in T₂ relaxation time, rather than changes in NMR chemical shifts.

Applicant is required to cancel the new matter in the reply to this Office Action.

3. Objection to claim 10 is withdrawn. All other rejections and objection to the specification established in the previous Office action are maintained.

Drawings

4. The drawings are objected to because Figures 2a-4a and 2b-4b do not have any captions for the coordinates of the plots, which makes it unclear, as to which units and which parameters are being measured and presented on the graphs. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be

Art Unit: 1797

necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The amended specification is objected to as disclosing the statements that are not technically correct. For example, the statement that "persistent organic radicals have free electrons" is not a correct statement (see page 5, paragraph [0010]). The radicals do not have "free electrons". The radicals have unpaired electrons, which are *not* free electrons. Furthermore, the radical cannot "pair" with another electron. The radical can "pair" with another radical. Therefore, the statement is misleading and incorrect.

Further, on page 6 the specification refers to NMR data and T2 inversion response. It is neither clear, which NMR data and in which units were measured, nor what the parameter "T2 inversing response" might be. T₂ is a spin-spin relaxation time. What is the "time inversion response"?

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1, 8-14, 17-18, 32, 37 and 46-47 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The examiner respectfully reminds the Applicants that according to MPEP §2163:

"2163.02. Standard for Determining Compliance with Written Description Requirement:

Art Unit: 1797

The courts have described the essential question to be addressed in a description requirement issue in a variety of ways. An objective standard for determining compliance with the written description requirement is, “does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed.” *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). Under *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991), to satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed. The test for sufficiency of support in a parent application is whether the disclosure of the application relied upon “reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter.” *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985) (quoting *In re Kaslow*, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983)). Whenever the issue arises, the fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed. See, e.g., *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). Possession may be shown in a variety of ways including description of an actual reduction to practice, or by showing that the invention was “ready for patenting” such as by the disclosure of drawings or structural chemical formulas that show that the invention was complete, or by describing distinguishing identifying characteristics sufficient to show that the applicant was in possession of the claimed invention. See, e.g., *Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 68, 119 S.Ct. 304, 312, 48 USPQ2d 1641, 1647 (1998); *Regents of the University of California v. Eli Lilly*, 119 F.3d 1559, 1568, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997); *Amgen, Inc. v. Chugai Pharmaceutical*, 927 F.2d 1200, 1206, 18 USPQ2d 1016, 1021 (Fed. Cir. 1991) (one must define a compound by “whatever characteristics sufficiently distinguish it”).

Currently amended claim 1 recites:

A method of distinguishing oil based drilling fluid from subterranean formation fluid hydrocarbons during nuclear magnetic resonance testing while drilling a borehole in the subterranean formation, said method comprising:

drilling a borehole in a subterranean formation using oil based drilling fluid; during the drilling, adding paramagnetic species to the drilling fluid, wherein said paramagnetic species comprises Fe^{3+} , Mn^{2+} , Ni^{2+} , and Cu^{2+} , Gd^{3+} , tetramethyl-piperdinenyl-1-oxyl ions or combinations thereof;

and circulating the drilling fluid containing the paramagnetic species in the borehole prior

to said testing, wherein the testing comprises logging the borehole, taking nuclear magnetic resonance measurements of the subterranean formation during the

Art Unit: 1797

logging, and identifying *the shift in the NMR response or T2 inversion* that distinguishes the drilling fluid from formation fluid hydrocarbons.

The specification discloses in Experimental part adding paramagnetic ions (Fe^{3+} or Mn^{3+}) to commercially available synthetic drilling fluid base, ACCOLADE[®], with a fully expected results of shortening relaxation times T_2 of the fluid and thus broadening its NMR signals. Nothing that resembles the method recited in claims 1 and 8 is disclosed in the specification in the experimental part. Therefore, the Applicants did not show possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention, and did not reasonably convey "to the artisan that the inventor had possession at that time of the later claimed subject matter". The specification does not disclose any "shift in the NMR response" - there is signal broadening, which is not changing the chemical shift.

Furthermore, the specification does not disclose, as to how it is possible to distinguish oil based drilling fluid comprising paramagnetic species from subterranean formation fluid hydrocarbons, when the oil based drilling fluid readily intermixes with the formation hydrocarbons, with the latter being susceptible to exactly the same influence of paramagnetic species, as the drilling fluid, and with the same effect of paramagnetic species on the NMR spectra lines, as for the oil drilling fluid. The problem if intermixing the drilling oil-based fluid and the formation hydrocarbons is also indicated in the prior art, see Ramakrishnan et al. (US 7,134,500), "when a well is drilled with oil-based-mud (OBM) the filtrate may miscibly mix with the formation fluid" (see col. 1, lines 48-50). It is well known for a person of ordinary skill in the art (as well as for a person skilled in the art and for an expert in the art) that the presence of even traces of paramagnetic impurities in the sample leads to a significant broadening of NMR spectral lines.

Furthermore, the specification discloses the following:

"[0009] The present invention provides a nuclear magnetic resonance (NMR) method for detecting the presence and preferably also the amount of any invasion or filtration of oil-based drilling fluid into a subterranean formation from a borehole penetrating the formation and drilled with the drilling fluid. That is, the present invention provides a method for distinguishing native or residual hydrocarbons in a formation from oil-based drilling fluid so that the drilling fluid does not distort the detection or measurement of such hydrocarbons using nuclear magnetic resonance."

Art Unit: 1797

"[0021] In the present invention, a method is provided for enhancing the contrast in the NMR tool response between oil-based drilling fluids and the formation oil so that hydrocarbons may be detected, oil or residual oil saturation determined, and/or contamination by drilling fluid in the formation, may be analyzed with NMR tools."

The specification is silent regarding "a process of analyzing the fluid composition of a subterranean formation" as claimed in claims 14-18.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1, 8-14, 17-18, 32, 37 and 46-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 8, 11, 14, 32 and 37 recite "shift in the NMR response". It is not clear, as to what this expression might mean. Is this a change in NMR chemical shift? What is NMR response? Is this an NMR signal? The expression "shift in the NMR response" renders all claims unclear and indefinite. Amended claim 1 now recites "T2 inversion". What is T2 inversion? T2 is the time period, and it's not apparent, as to what the "time inversion" might be.

Claim 14 recites "a process of analyzing the fluid composition of a subterranean formation". Conventionally subterranean formations are complex mixtures of hydrocarbons with overlapping signals in NMR spectra. It is unclear from the claim, as to what is meant by the expression "analyzing the fluid composition of a subterranean formation", since the specification does not provide any disclosure for this type of analysis, which makes it unclear, as to what is meant by the expression, and which are the metes and bounds of the subject matter of the claim. The examiner respectfully reminds the Applicants, that according to the second paragraph of 35 U.S.C. 112, "[t]here are two separate requirements set forth in this paragraph: (A) the claims must set forth the subject matter that applicants regard as their invention; and (B) the claims must particularly point out and distinctly define the metes and bounds of the subject matter that will be protected by the patent grant."

Claim Rejections - 35 USC § 102/103

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. **Claims 1, 8-14, 17-18, 32, 37 and 46-47** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kleinberg (US 6,346,813).

Kleinberg discloses “magnetic resonance method for characterizing fluid samples withdrawn from subsurface formations” (Title) and teaches, “[d]issolved paramagnetic compounds will reduce the proton relaxation times of oils. Thus if two oils have the same viscosity, they will have different relaxation times if they have substantially different paramagnetic content. While many crude oils and most oil base mud filtrates have negligible magnetic content, some crude oils have significant amounts of vanadium or nickel [Tissot and Welte, "Petroleum Formation and Occurrence", Springer-Verlag, 1978, Figure IV.1.20]. Because the relaxation effect is proportional to paramagnetic concentration, the proportions of two oils in a mixture can be monitored. *Deliberate introduction of an oil-soluble paramagnetic substance into the oil base mud can considerably enhance this effect when the native crude is relatively free of paramagnetic material*” (col. 8, lines 5-18). Kleinberg specifically indicates that paramagnetic substances are salts of the transition metals: “[u]npaired electrons are found in naturally occurring or *artificially introduced magnetic transition metal ions such as iron, manganese, chromium, cobalt, vanadium and nickel*. These last two are frequently found in crude oils. Chromium is found at high concentration in a number of water base mud filtrates. Natural ground water has significant iron content. In general, mud filtrates and formation fluids will have different concentrations of transition metal ions” (col. 9, lines 31-37).

Thus Kleinberg teaches adding oil-soluble paramagnetic species into the oil-based drilling mud during drilling operation (with inherent circulation of the fluid in the borehole) and differentiating the mud from the formation fluid using NMR spectra by determining different values of relaxation parameters of NMR spectra of the mud and the formation, which covers the subject matter of the indicated claims; the claims directed

Art Unit: 1797

toward detecting hydrocarbon-bearing zones are obvious in the light of differentiating between the oil-based mud with added paramagnetic species and hydrocarbon fluid formation with NMR spectroscopy.

Response to Arguments

12. Applicant's arguments filed 07/31/09 have been fully considered but they are not persuasive.

Regarding the Applicants' request to transfer the application to a different Technological Center, and specifically to AU 2862, the examiner would like to indicate that it is not in the examiner's authority to transfer cases assigned to the present examiner. Moreover, AU 2862 of TC 2800 mentioned by the Applicants is dealing with hardware NMR spectrometers and development of NMR pulse sequences for field NMR explorations, which are based on hard core physics of NMR. Thus, if the Applicants consider the present examiner as having "high level of skill and expertise with NMR spectroscopy", the examiner believes that the examiners of AU 2862 have even higher level of skill and expertise with NMR spectroscopy.

Objection to the amendment. As the examiner indicated previously, it is not clear, what the Applicants mean by the expression "identifying the shift in NMR response that distinguishes the drilling fluid from formation fluid". The examiner also indicated that there might be two parameters which would relate to such expression - relaxation times (T_1 and T_2) and chemical shifts of the NMR signals. Since the present amendment clearly differentiates between these two parameters by reciting both of them, it means that the expression can be interpreted in relation to changes in the chemical shift. The specification, however does not disclose any changes in the chemical shifts of the signals. The whole specification is directed exclusively to measurement of the relaxation times; the expression that the Applicants refer to in the specification as being disclosed in paragraph [22] (*sic!*) obviously refer to changes ("shifts") in " T_1 and T_2 responses" as expressly disclosed in paragraph [0011]. Therefore, recitation of the shift in terms of chemical shift as can be concluded from presently amended claims is new matter to the original disclosure.

Art Unit: 1797

Objection to the specification. It is not quite clear, as to what the MPEP recitation regarding "piecemeal examination" has to do with the examiner's objection to the specification, which discloses incorrect things. It is also not apparent, as to which "common knowledge" or "official note" the examiner is supposed to provide for the support of the objection. The recitation of the Applicants from Wikipedia fully corresponds to the examiner's statements in the previous and present Office actions. The examiner would like to emphasize that *unpaired* electrons are **not** *free* electrons, and that free *radicals* are **not** free *electrons* either. The examiner refers the Applicants to any textbook on chemistry or physics which would provide the corresponding background. The examiner adds objection to the specification in light of the present amendment, since it is not clear, what "T2 inversion" might be.

Objection to claim 10 is withdrawn.

Rejection of the claims under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The Applicants state the following: "Applicants respectfully submit that the Examiner mischaracterizes Applicants' claims and their supporting specification because the Examiner relies on her own knowledge and experience which is not based in the relevant art--the art of drilling and testing of subterranean boreholes or oil wells for the detection and recovery of hydrocarbons from subterranean formations." This statement is not quite correct, since the examiner provides references which are related exactly to "the art of drilling and testing of subterranean boreholes or oil wells for the detection and recovery of hydrocarbons from subterranean formations" and the examiner does not find any discrepancies between "her own knowledge and experience" and those of e.g. Kleinberg. Regarding the expression "shift in NMR response", the examiner would like to recall some basic principles of NMR experiments. Any NMR response from any material can be presented as Free Induction Decay (FID), which is a complex superposition of decaying sinusoidal responses from nuclei in the material, if presented in time domain, and a set of signals, which are obtained from FIDs by Fourier transformation, when is presented in frequency domain. Signals in NMR spectra are defined by their chemical shifts, i.e. their position in the spectrum, and their linewidth,

Art Unit: 1797

which is directly related to spin-spin relaxation times T_2 . In light of this, the expression "shift in NMR response" is unclear and ambiguous, since it is not apparent, as to what the Applicants refer to - chemical shifts or relaxation times. Moreover, the Applicants contradict their own disclosure when stating that they do not discuss signal broadening. In fact they measure specifically the line broadening by measuring transverse relaxation time T_2 , because this time is a direct measurement of the line width of a signal, see "Basic Concepts T_2 relaxation times". Further, measuring T_2 using Carr-Purcell Meiboom-Gill (CPMG) pulse sequence is described by e.g. Ramos et al. in the paper "Low field ^1H NMR relaxometry and multivariate data analysis in crude oil viscosity prediction" (Chemometrics and Intelligent Laboratory Systems, 2009), and is illustrated by depicting T_2 echo relaxation curves, which to the examiner's understanding is what the Applicants call "NMR data". It may be tentatively concluded that what the Applicants call "shift in NMR response" is related to changes in T_2 relaxation times, but the current amendment to claim 1 does not correspond to such interpretation, since T_2 relaxation times is recited separately (if consider the expression "T2 inversion" equivalent to " T_2 relaxation times").

As to Ramakrishnan's disclosure, the examiner provides once more the exact recitation that the Applicants discuss: "*when a well is drilled with oil-based-mud (OBM) the filtrate may miscibly mix with the formation fluid*". It is not apparent, as to how this recitation is related to a laboratory technique. The examiner is not aware of any laboratories which would have wells that can be drilled with oil-base mud. Also, if the Applicants are trying to emphasize that the word *sample* is related exclusively to the laboratory testing, the examiner believes that the Applicants are not quite correct here, since any testing either in laboratory or in field conditions, requires sampling.

Regarding preambles to claims 8-10, 11-13, 14-18 and 32-37, it is not quite clear, as to what the Applicants mean by saying that "such preambles are commonly used in the relevant art". To the examiner's understanding the recitation of the claims, including their preambles, should reflect what is invented by the Applicants, rather than what is "commonly used in the relevant art". However, the Applicants have demonstrated that the language of the preambles in claims 8-10, 11-13 and 32-37 is supported by the specification, while failed to do so for the language of claims 14-18.

Art Unit: 1797

Regarding rejection of the claims under of 35 U.S.C. 112, second paragraph, the Applicants failed to clarify the meaning of the expression "shift in the NMR response" essential for the instant invention. The examiner respectfully requests the Applicants to provide at least one reference which would recite this expression. Regarding claim 14, the Applicants' statement that "the Applicants are not concerned with a detailed laboratory NMR analysis of the components for crude oil" and that "the Applicants are simply concerned with detecting drilling fluid filtrate" does not quite correspond to claim language: "[a] process of analyzing the fluid composition of a subterranean formation", and thus the Applicants' arguments are not convincing.

Regarding the Applicants' specific terminology, such as "NMRs", which are supposed to mean "NMR devices" (NMR spectrometers?), which have "low power" of about 1 Hz - the examiner respectfully requests the Applicants to read at least the paper of Ramos et al., which is relevant to the field of NMR logging and which is provided by the examiner for the Applicants' convenience. The paper discloses using NMR "devices" (spectrometers), whose "low power" is expressed in terms of MHz, which are MegaHertz, i.e. 10^6 Hz (one million Hertz) (please see page 2, paragraph 2.2. NMR measurements). It is a little bit different from 1 Hz, which the Applicants indicated. Also, the Applicants are respectfully referred to e.g. US 6,411,087, which discloses the following: "[f]or hydrogen nuclei, $\gamma/2\pi = 42.58$ MHz/T, so that a static field of 0.0235 Tesla, would produce a precession frequency of 1 MHz. U.S. Pat. No. 4,933,638 discloses *a wireline NMR logging tool that operates at a frequency of 1 MHz*, which is typical of prior art tools." (col. 3, lines 13-18).

Regarding rejection of the pending claims over the prior art, it looks like there is misunderstanding in the Applicants' interpretation of the section of MPEP 714.02 cited by the examiner. The examiner is not really sure, as to which "order [of] unduly burdensome and costly testing and comparative data" the Applicants are talking about? The examiner indicated that it is duty for the Applicants to specifically indicate differences between the teaching of the prior art and their own disclosure in response to the Office action. Which type of "burdensome and costly testing and comparative data" the Applicants refer to?

As to the differences between "the oilfield testing", which "is very different from running an NMR analysis in a laboratory", it appears that this correct statement is very applicable to the Applicants' own disclosure which obviously is based on laboratory tests.

In conclusion, the amendment to the claims did not overcome any rejections established by the examiner in the previous Office action, and the Applicants' arguments are not convincing.

Examiner's Note: the new references are provided by the examiner exclusively for the Applicants convenience in order to clarify examiner's position and are not relied upon in the Office action.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yelena G. Gakh, Ph.D. whose telephone number is (571) 272-1257. The examiner can normally be reached on 9:30 am - 6:00 pm.

Art Unit: 1797

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Y. Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yelena G. Gakh/
Primary Examiner, Art Unit 1797

10/7/2009